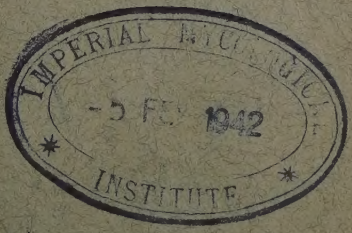
The Imperial Forestry Institute University of Oxford

SEVENTEENTH ANNUAL REPORT

1940—41



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SEVENTEENTH ANNUAL REPORT OF THE IMPERIAL FORESTRY INSTITUTE ACADEMIC YEAR, 1940-41

INTRODUCTION.

The year under report was the first entirely under the new organisation, and in normal circumstances it should have been possible to make a definite comparison of the new with the old, but circumstances were so far from normal that judgment will have to be reserved. The feature which caused most disturbance in trying out the new syllabus was the late arrival of the Colonial Scholars who formed the majority of the students. Owing to delays in completion of their military training, though continually expected, they only arrived in the seventh week of Michaelmas Term, and the courses for them had to be telescoped into those of the following terms. Only two students, one graduate and one undergraduate, went through the full course as planned.

Arrangements were further complicated by the necessity of meeting the requirements under the University Statute with regard to Geology. Forestry students have to pass an approved examination in this essential subject. Arrangements were made accordingly, and the special examination held by the Professor of Geology was approved by the Board of the Faculty of Biological Sciences. To meet the difficulty for the future the matter was considered by the Board and a new Statute was ultimately passed permitting candidates for the School of Forestry to offer a single subject in Honour Moderations: their names will not be included in the Class List but will be appended to it if they are judged to have shown knowledge adequate for the purpose of the Statute for Forestry. The date of the examination still requires adjustment.

The last Final Examination under the old three year course and the new Part I examination were held simultaneously in June; there was only one candidate for the former.

There were no changes in the staff, Colonel A. H. Lloyd remaining absent on Military Service, and Mr. A. Foggie continuing seconded from the Colonial Forest Service.

GENERAL.

Five Scholars were sent by the Colonial Office for their first year's training in Forestry at the Institute. One had recently graduated in Forestry at Edinburgh and the others were Honours Graduates in Natural Science, two in Botany at Cambridge, and one each in Botany and Zoology at Oxford. After the end of the year four were posted — to Malaya (1), Tanganyika (1), and the Gold Coast (2) — whilst the fifth continued work on a special course of training preparatory to taking up the post of Forest Botanist at the Forest College in Nigeria.

Two Colonial Forest Service Probationers back from Malaya attended for their final period of study.

The first year's course was also taken by one undergraduate and one graduate of Leeds University. Only one student remained to take the final third year course for the degree under the old syllabus.

No Forest Officers on leave took Refresher Courses, but a number visited the Institute to renew contacts and in several instances to make brief use of the library and other facilities. Officers from Nigeria and the Cold Coast were included. Among other visitors were several Dominion foresters serving in the Forestry Companies of the Royal Engineers, from Canada, Australia and New Zealand. Several officers of the British Forestry Companies are former students of the Institute, and three were recently released from military duty to take up work in the Sudan where trained foresters were urgently needed.

Further arrangements were made for practical work to be done in this country in place of the hitherto customary tours on the Continent. Full facilities were given by the Forestry Commission, and it can be said that whilst it must be many years yet before Britain can provide a training ground completely adequate for our requirements, a steady improvement in this respect is taking place. In several fields, especially in silviculture, mensuration and experimentation, we can find all we need; the important exception is forest management, but the year's experience shewed that a good deal can be taught in English forests. Visits were made in the summer term, as usual, to the nearer forests and other places of interest to foresters, with the much appreciated permission and assistance of the Forestry Commission, the Commanding Officer of the New Zealand Forestry Company and private owners. The places visited were the following :—

1. The Sawmills of the New Zealand Forestry Company at Cirencester, Bowood and Grittleton.

2. Hazelborough Forest, Northants.

3. Wheatley Sawmill and woods at Stanton St. John.

4. West India Timber Docks and Works and Timber Yard of Messrs. Gliksten and Son, Ltd., London.

5. Alice Holt Forest, Hants.

6. Forest Products Research Laboratory, Princes Risborough.

7. Caesar's Camp and Bramshill Forests, Berks.

The research work in war-felling areas undertaken in the Summer Vacation of 1940 was continued in the field in 1941 by the same members of the staff, the Forestry Commission having continued to finance it. Parties were organised at the Universities of Oxford, Cambridge, Bristol, North Wales, and Newcastle as before, whilst new parties were formed in Edinburgh, Glasgow, and Aberdeen, and composite parties worked from Taunton and Newtown (Shropshire). It was decided that some members of the Institute staff should complete other parties instead of making up two parties at Oxford, and this enabled the Bristol party, which had lost one of its most active members by the death of Dr. Bracher, to continue work, and a new party to be formed working in Shropshire and Montgomeryshire. Although the number of sites examined was less than in 1940, it is believed that the better selection of sites should compensate for this. Whereas last year, the chief difficulty was to find foresters, this year the shortage was in soil scientists, the absence of the Reader in Soil Science being particularly felt. In addition to the field work, a great deal of calculation and computation work is involved. This is still under way in all the co-operating institutions, and is being done more or less concurrently with the general compilation at the Institute.

SILVICULTURE.

During the Michaelmas and Hilary Terms a course of lectures on Silviculture was given by Dr. E. W. Jones to those taking the first year course under the new system, and it was accompanied by practical work. In the Trinity Term a course of lectures on Forest Ecology was delivered. Throughout the year subjects connected with general and forest ecology and plant physiology in its bearing on Forestry were examined with the Probationary Forest Officers back from the Colonies, and there was practical work in connection with this in Bagley Wood and elsewhere.

Much practical silvicultural work was done during the Easter Vacation, when a large block of the High Meadow Woods adjacent to that studied last year was examined, so that much information on soil, vegetation and growth of oak over a large part of these woods has now been gathered and will be of permanent value.

Further practical work was done with the students in the New Forest in June when the opportunity was taken, in the course of studies of regeneration problems in oak and conifers, of extending and checking information gathered on previous visits. The silviculture of beech was dealt with in a series of visits to the Chiltern Hills, where facilities were kindly given by the owners, in the Hampden Woods.

Research. Two new sets of experiments have been laid out by Dr. E. W. Jones in Bagley Wood; one a series of trenched quadrats for the purpose of demonstrating the effect of root competition, the other to study the expansion of the crowns of trees after release from suppression by thinning.

Mr. R. G. Sanzen-Baker remained attached to the Institute in his capacity of Research Officer for England and Wales Forestry Commission. No further reductions in field staff have taken place during the year. Expansion of silvicultural research work has been restricted in certain directions by war conditions. On the other hand, war-time fellings have raised their own peculiar problems, for example, the thinning of plantations to obtain a maximum yield and at the same time to safeguard the future crop, the seasoning of pit-props, and the re-conditioning of woodlands in which the best trees have been cut out.

Nursery research work has been continued in the various experimental nurseries throughout the country, both on old woodland and heath soils and on agricultural soils such as those at Kennington Nursery, near Oxford. The maintenance of soil fertility in this type of nursery is a problem that has been the subject of much attention, but such investigations are naturally of a long-term character.

Methods of sowing and subsequent treatment have again been the subject of experiment. Further trials with a wide range of seed covering materials have failed to find anything better than the coarse silver sand from Leighton Buzzard which has for several years been regarded as the ideal seed covering material at Kennington. Broadcast sowing in conjunction with the use of this covering material has been shown to give better plants and higher production than drill sowing even when combined with frequent hoeings.

Work on the nursery treatment of broad-leaved trees has been continued, the species concerned being ash, beech, poplar and walnut.

Vegetative propagation of conifers has again been the subject of experiment. This work has been confined to two species, namely, Norway spruce and Corsican pine, as the usual continental supplies of seed have been cut off. In order to keep this work on a practical basis, no artificial heat has been employed in the seedbeds or frames. Therefore, it is of considerable interest to record that in open seedbeds rooting has been obtained in 42 per cent. of the Norway spruce cuttings treated with pure talc and with talc and indolylacetic acid and subsequently watered with a nutrient solution. No success has been obtained so far with Corsican pine. Mr. W. R. Day co-operated in this work.

The technique of composting such materials as hop waste and bracken has been developed on practical lines, and the use of such composts in connection with sowings on old woodland and heath soils has given remarkable results. This work is intimately connected with that of raising planting stock with good mycorrhizal equipment. Dr. M. C. Rayner and Dr. I. Levisohn of Bedford College, London, have continued to co-operate in these researches; this co-operation has been facilitated by Dr. Levisohn's evacuation to Oxford.

Facilities have as usual been afforded at Kennington Nursery to Mr. J. M. B. Brown for his cockchafer investigation.

Afforestation experiments on upland and lowland heaths are giving most interesting results, particularly as regards soil cultivation and mixtures of coniferous species. Broom sown with a phosphatic manure and used as a nurse for Sitka spruce and other species has produced very spectacular and promising results on very difficult *Calluna* ground. Also, it has been shown that Scots and Corsican pine transplants raised in compost treated seedbeds on heath land give better results, at least in the early stages, than nursery raised transplants of similar type.

Season-of-planting experiments have been carried out for the third year in succession with beech on chalk downland in Hampshire and with Lawson's cypress on lowland heath in Dorset. In the case of the beech, October appears to be the best month for planting, and for Lawson's cypress, October and March, but results are not so definite with this species.

The series of experiments dealing with the seasoning of pit-props started in the spring of 1940 was repeated under winter conditions. Briefly, the results indicate that props cut and peeled immediately, during the summer months, lose up to about a

half of their weight after being stacked for about eight weeks or even less, while props left with their bark on only lose about a third or a half of this amount; autumn and winter cut props dry out much more slowly even when peeled, and may take as long as six months to lose the same proportion of their weight.

An investigation is in progress regarding the thinning of young plantations, the object being to evolve a method of thinning to produce a maximum yield of utilizable material now and at the same time to avoid clear felling and to safeguard the future of the crop.

Another line of enquiry which is being followed is the treatment of derelict or semi-derelict woodlands such as will be very abundant after the war. Experimental work is being initiated in various places aiming at getting up the best growth under the circumstances with maximum use of existing tree growth and natural regeneration and with minimum expenditure in labour and money.

Further studies have been made in mixed plantations of pine and spruce in furtherance of the general investigation relating to such mixtures.

Mr. W. R. Day has continued his co-operation in various investigations and enquiries, particularly that concerning the die-back and subsequent death of European larch plantations in various parts of Wales and the west of England.

Several new species of poplar have been introduced into the Poplar Garden at Yardley Chase in Northamptonshire, and many of the earlier planted species are now making satisfactory growth.

Sample plot work has been maintained; the scheduled programme of thinning and remeasuring some 22 permanent sample plots was carried out and three new sample plots were established in England and Wales. More privately owned plots have been felled in the course of war fellings, which is regrettable but hardly avoidable.

The arrangement with St. John's College regarding the supervision of Bagley Wood, near Oxford, has continued to be satisfactory, and the production of pit-props and other produce has been maintained. The woodland nursery established there for research purposes is giving useful and interesting results, particularly with regard to beech. Four coniferous species were dealt with in Bagley Wood in the pit-prop seasoning experiment, and charcoal has been prepared experimentally in portable iron kilns.

MENSURATION AND MANAGEMENT.

This Section remained in the charge of Mr. A. Foggie, seconded from the Colonial Forest Service since April, 1940. First year lectures on Mensuration were given during the Michaelmas and Trinity Terms. As part of the practical work, the students carried out the mensuration of a new Sample Plot in deodar in Bagley Wood during the Michaelmas and Hilary Terms.

The more advanced students, including Colonial Forest Service Probationers, made a special study of the problems connected with the management of irregular forests under the selection and similar systems. They also studied advanced mensuration and carried out practical work in connection with it in Bagley Wood.

During the Easter Vacation all students worked in the High Meadow Woods, where most of the field work for the preparation of a working plan was done for a selected section of Reddings Lodge Enclosure. A soil survey was made as part of this work under the direction of Mr. G. R. Clarke of the School of Rural Economy.

Among the day excursions already mentioned, Hazelborough Forest, Northants., Alice Holt Forest, Hants., and the Caesars Camp and Bramshill Forests, Berks., were particularly chosen for the opportunities they offered for demonstration of points in forest management, and the Institute is much indebted to the Forestry Commission for giving facilities for the visits, and to their officers, Messrs. Stileman and Best, who accompanied the party.

At the beginning of the Summer Vacation a fortnight's visit was paid to the New Forest, where regeneration problems of oak, Douglas fir, and Scots pine were studied. This was followed by five days' work in the Chiltern Hills, where regeneration and management were studied in the Hampden Beech Woods.

Research. A considerable amount of work was done in testing methods of assessment of density, including the preparation of a curve expressing the relation of crown length to total height for Scots pine. Work was also done on correlation of Mean Height and Top Height for European larch.

In view of the probability that British woods and forests will alone be available for demonstration work for some years to come, enquiries were made from all likely sources of information regarding Working Plans for Estate and Commission woods. A number of interesting plans were received and examined. Those considered useful have been copied and make a needed addition to the Library.

SOIL SCIENCE.

In Michaelmas and Hilary Terms Mr. G. R. Clarke gave lectures and field demonstrations to the Colonial Scholars and Probationers. Soil Survey work was carried out in the Forest of Dean during the Easter Vacation, and further practical work was done in the course of silvicultural studies in the New Forest. No course was required in Tropical Soils, fortunately, as Mr. Morison, Reader in Soil Science, was absent most of the year, though he took part in the volunteer research work during the Long Vacation in 1940.

TROPICAL FOREST BOTANY.

Although the Botany Section of the Imperial Forestry Institute was transferred to the Department of Botany in 1939, the Forest Herbarium and staff remain in the Institute building and their work naturally remains of special interest and importance to the Institute. Moreover, as the Department of Botany held that the work of preparation of Check-lists of woody plants was outside the normal scope of its work and impossible with the present staff, special provision had to be made. The Institute decided to complete the Tanganyika Check-list begun by Dr. Hora, Mr. J. P. M. Brenan being appointed for this purpose.

Mr. A. C. Hoyle continued in charge under the Department of Botany, and gave a course of lectures with practical work in systematic botany, which was attended by most of the students. A series of lectures on Forest Ecology and vegetation types was given jointly by Dr. Jones (general and temperate zone), Mr. Hoyle (the drier tropical forests as represented in the Anglo-Egyptian Sudan), and the Professor (the moister tropical forests). Mr. Hoyle continued his study of the important African tree genus *Brachystegia*, the whole of the Kew Herbarium material of which, with the exception of types, has been brought to Oxford and stored in the basement of the Institute for greater safety and accessibility.

Mr. H. L. Dunkley, technical assistant, was seconded to clear off the arrears of identification of collections received from the Colonies. This he has nearly succeeded in doing, as accessions of new material have been restricted by war conditions. With occasional assistance from Mr. Hoyle and Mr. Brenan, he has identified in all some 1,420 numbers. He has also made numerous additions to the card key to Uganda trees and shrubs, originally prepared by him with Mr. Cree of the Uganda Forest Service.

The Vernacular list of Part I of the Tanganyika Check-list, compiled by Dr. Hora, was edited by Mr. Hoyle and Mr. Brenan, and finally published in the spring of 1941. It was bound up with the Botanical-Vernacular list compiled by Dr. Hora and edited by Dr. Burtt Davy, which had been printed in 1940. Part II of the Check-list will give ecological notes on most of the species listed and is in course of preparation by Mr. Brenan, rather more than one-third being now in manuscript. A considerable amount of correction and revision, sometimes of a whole genus, has not unexpectedly been found necessary in the course of the work.

It was decided early in 1940 that the whole Herbarium was in urgent need of poisoning, which essential operation had been neglected during the early period of its rapid growth. Some 30,000 sheets having been dealt with, this work has nearly been completed, though it has interfered considerably with other routine duties. Much unmounted material remains to be treated. Over 1,000 specimens have been mounted and laid away as identified by Mr. Brenan and Mr. Dunkley. A further 9,000 mounted specimens will be laid away when the technical assistant can return to normal duties.

FOREST PATHOLOGY.

Mr. W. R. Day continued in charge of the Section, assisted by Mr. F. H. Jones as laboratory and field assistant. Mr. T. R. Peace, of the Forestry Commission, continues to act as District Forest Officer in the Forest of Dean and so has been unable to continue his research work at the Institute. Mr. Day gave the course of lectures on Forest Economics as well as courses in Forest Pathology.

Research has been unavoidably deflected along special lines and also limited in extent owing to the prevailing war conditions. The pathologist has taken part in the special research already referred to, and carried out at various Universities throughout Britain in connection with the emergency war felling of timber. It has not yet been possible adequately to analyse the pathological data collected, but a number of points of considerable interest are appearing. The following apply to the area surveyed by the Oxford University working parties :—

(1) *Butt-rot.* The indications are that a tendency to develop extreme moisture conditions is correlated with a prevalence of butt-rot, but the actual course of events which accompany the death and infection of the roots is not known. Butt-rot is a commoner source of loss among conifers, especially larch and spruce, than has hitherto been realised.

(2) As previously reported by Mr. Peace, *Fomes annosus* is the principal agent of decay. *Polyporus schweinitzii* would appear to be next in importance.

(3) There are indications that the death of roots is associated with parasitic action in the bark of the root by the fungus concerned; also that this parasitism is possible only locally in limited soil layers. The conditions which make possible this parasitism need much further investigation.

(4) It has also been found that on heavy soil beech roots are able to endure the conditions in the imperfectly drained subsoil much better than larch. The prevalence of butt-rot in this case was related directly to this lack of physiological adaptation, the larch being commonly affected whereas the beech were free. This observation seems to indicate that mere mixture of species may have little effect on the conditions in certain soil types in preventing butt-rot from developing in certain species. Again, much more evidence is needed.

Other points of interest are that lime-induced chlorosis has been observed in an acute stage in Japanese and hybrid larch, the more severely affected trees on sites permitting only shallow root penetration owing to the occurrence of a bed of re-cemented chalk rubble in the sub-soil. It is thought that this may provide one clue to the variation in intensity of this disease which is so commonly to be observed in trees growing on calcareous soils. Corsican pine and Scots pine were also observed to suffer from this chlorosis, though the colour change was less obvious. They are liable to die, even though of some age, when so affected. A closer investigation of this interesting problem is needed. An examination of mycorrhiza on affected trees was kindly made by Dr. Levisohn through the courtesy of Dr. M. C. Rayner of Bedford College, London. It was suggested that defective mycorrhizal conditions are associated with the development of chlorosis. Chlorotic European larches responded satisfactorily to injection tests made by Mr. F. H. Jones, producing a healthy green colour. Chlorotic beech twigs injected with iron salt solution in the spring of 1940 still bore healthy green leaves this year, the remainder of the tree being still conspicuously yellow.

Die-back of European Larch. The work on conditions affecting the growth of European larch being carried out in collaboration with Mr. Sanzen-Baker could not be completed owing to pressure of other work. The following points are suggested by the observations made so far :—

(1) Much of the severe die-back occurs at relatively high elevations for tree planting in this country.

(2) It is also found in situations in which severe frosts occur.

(3) It occurs also in exposed situations and especially those exposed to the east.

(4) Certain topographical formations favour it, the ravine type being outstanding.

(5) It is the elevation relative to the surrounding topography and not the absolute elevation that is important. ((2), (3) and (4) appear to be connected with this.)

(6) Certain soil profile types may favour the occurrence of the disease, *e.g.* a fairly shallow freely draining loam over excessively drained fissured hard rock.

(7) There is a possibility that nutrient deficiencies may sometimes contribute to susceptibility. Tests have shown, for example, that the soil in affected areas may be extremely poor in potash.

(8) The provenance of seed is undoubtedly of considerable importance, but a provenance which is unsuccessful in one situation may be successful in another.

These suggestions need development, but they serve to indicate the complexity and scope of the problem.

Elm Disease. The report for 1940 was submitted by Mr. Peace in June this year. The survey of the disease was necessarily curtailed and the continuance of future research will be possible only to a limited extent. The survey was carried out in 1941. The disease proved to be less prevalent and the severity of attack was less than in the previous year. This is to be accounted for by the cool, wet summer. Arrangements have been made in the Forest of Dean for a large plantation of elm strains supposedly resistant to the disease.

Root stimulating substances. The section has collaborated with Mr. Sanzen-Baker in his research into the stimulation of root development in conifer cuttings. Mr. Peace had previously been connected with this work. Mr. F. H. Jones has had the duty of carrying out that part of this work for which the section is responsible. The work is still in progress.

Strains of Douglas Fir. Arrangements have been made for planting out in the Forest of Dean the Douglas fir raised from seed collected in North America by Mr. Peace in 1938 from selected plots covering the range of this species from the coast of British Columbia to the heart of the Rocky Mountains. This collection was begun as part of a study of strains of this species before the war as a result of observations on varying resistance under adverse locality factors.

ENTOMOLOGY.

Though now under the direction of the Hope Department of Entomology, the former Entomological Section of the Imperial Forestry Institute remains in the Institute buildings and continues to deal with education and research in forest problems. Dr. Chrystal gave courses of lectures and practical work in Forest Zoology during Michaelmas and Hilary terms to students starting their forestry training under the new regulations, and to one who was finishing his course under the old regulations.

Researches carried out on behalf of the Forestry Commission have been in charge of Mr. J. M. B. Brown. These have been chiefly concerned with the control of chafer larvae in forest nurseries. Further experiments in the use of repellent dusts to deter the adults from egg-laying were carried out at Rhinefield Nursery, New Forest. Naphthalene was employed, and the results obtained showed that with further perfection in details, this substance may prove a valuable means of reducing losses in nursery stock, especially seedling plants.

Experiments with Paradichlorobenzene were continued at Kennington Nursery and in the New Forest. These were slightly hampered by the effects of the lateness of the spring on the movements of the grubs, but definite results were obtained bearing on the best methods of application to ensure proper contact of the insecticide with the grubs, and also on effects of the larvicide upon plant growth under certain conditions.

Cultural measures of control have been further tested, in particular the method of rotary cultivation of nursery ground, cultivation by plough and harrow, and hand collection of the larvae. The results in the first case were encouraging, as they showed what conditions must be satisfied in order that the largest numbers of larvae possible should be affected, particularly the younger stages. Interesting results were also obtained in the two other cases, showing that both methods were useful but accessory to the first one. The most important task for the future remains the discovery of a really efficient larvicide.

Further data were collected on the soil levels inhabited by the larvae in summer in soils of different localities, and on the dates of the autumn and spring migrations. Information was also gathered on the extent and occurrence of the *Dexia* parasite, and the fungus, *Beauveria densa,* which was found in several localities in the Forest of Dean.

In addition to these investigations, further data were collected on the present status of nursery soil pests in southern England.

During 1940, extensive damage to young broad-leaved trees and conifers by weevils in war emergency felling areas was reported from the New Forest, Tintern and Dean Forests. Three weevils were found to be principally concerned—*Otiorrhynchus singularis* L., *Strophosomus lateralis* Payk., and *Caenopsis fissirostris* Walt.; and along with these there also occurred the species *Phyllobius glaucus* and *Barypithes araneiformis*. Much information was obtained on the biology and habits of these species, the conditions and methods under which control would be likely to be most effective, and on the natural enemies of the insects operating in the areas concerned.

Experiments on the control of the Pine Weevil (*Hylobius abietis*) had to be drastically curtailed owing to labour shortage, but a few were carried out on a method of partial stump barking to destroy the broods, and a study of the density of trapping and its relation to increased captures of weevils. Poisoning of Scots pine branches with calcium arsenate or Derris dust was also tried in pit traps, and favourable results were obtained with the former substance.

Some observations were made upon the extent and severity of an outbreak of the Oak Roller Moth and Winter Moths in the Forest of Dean.

Very few inquiries were received during the year. The usual annual inspection of the timbers and woodwork of the Rhodes House building was carried out in the spring and early summer, Some bibliographical work connected with researches on the Platypodid beetles was carried out for Mr. F. E. Browne, Kuala Kai, Kelantan, Malaya. Several reviews of current publications on Forest Entomology were written for the Empire Forestry Journal and the Forestry Bureau.

WOOD STRUCTURE.

Dr. L. Chalk, who continued in charge of this section, gave the courses of instruction required in the first year's work under the new syllabus, and a special course to the senior students. He also undertook the teaching of Forest Utilisation in the absence of Colonel Lloyd.

The exceptional demands of teaching brought to a standstill during the greater part of the year the research on the systematic anatomy of dicotyledonous woods planned in collaboration with Dr. C. R. Metcalfe, of the Royal Botanic Gardens, Kew. Work was, however, resumed towards the end of the year and a few more families were completed. It is hoped that considerably greater progress will be possible during the coming year, though the demands of teaching are again likely to be heavy.

The number of identifications carried out during the year was 47, most of which were the result of enquiries received through the Colonial Forest Resources Development Department.

Very few additions were made to the wood collection, these being almost entirely limited to specimens received from the Forest Products Research Laboratory, Princes Risborough, and the Colonial Forest Resources Development Department.

Professor L. N. Rao, of the University of Mysore, spent about three months with the Section, studying anatomy in connection with his research on the sandalwoods.

FOREST UTILIZATION AND ENGINEERING.

In the continued absence of Colonel A. H. Lloyd on war service, the first year course in Forest Utilization under the new syllabus was prepared and given by Dr. L. Chalk. Visits were paid to a sawmill operated by a Forestry Company of the Royal Engineers with Colonel Lloyd, to a sawmill at Wheatley, to the premises of Messrs. Gliksten in London, to the West India Docks, and to the works of Messrs. Birch at High Wycombe. Special thanks are due to Colonel Lloyd, Messrs. W. Avery Bros., Ltd., Messrs. Gliksten and Son, Ltd., Messrs. Birch, and the Port of London Authority, for the facilities given, and to Major Cosgrove for making arrangements for the London visits. A very instructive day was also spent at the Forest Products Research Laboratory at Princes Risborough, for which our thanks are due to the Director and his staff.

Mr. O. H. Chilton, Reader in Surveying, kindly undertook the teaching in Forest Engineering and acted as Assessor in the examination held in the subject.

SURVEYING.

Mr. O. H. Chilton lectured in Michaelmas Term and the beginning of Christmas vacation to the first year Colonial scholars and first year students.

During the Trinity Term a road alignment project was carried out in Bagley Wood by the senior students under the direction of Mr. A. Foggie.

LIBRARY.

The number of accessions during the year was 1,847; of these, 42 were books and 903 issues of periodicals. The items received included 246 sent on direct request. Material received in exchange remained fairly constant, despite the difficulty of maintaining this relationship with institutions overseas.

Loans, apart from books kept more or less permanently in the rooms of staff-members, totalled 2,118: 947 to staff, 712 to the Imperial Forestry Bureau, 250 to students, and 209 to outside borrowers, chiefly by post. Although the loans to students were fewer than last year, the amount of reading done in the library was higher, reaching 538 student-periods: the total number of readers was 1,082, including 151 visitors, a marked increase over last year. A high proportion of these required information and the looking out of references. At times the provision of desk-space was difficult and there was some unavoidable discomfort.

Part-time assistance in correspondence was again provided by a member of the office staff. Letters received numbered 422; letters sent, 761. In several instances letters had to be sent two or three times on the same errand overseas, owing to mail losses en route.

The number of current periodicals is now 122. This is somewhat lower than last year, as issues from enemy and enemy-occupied countries have been in most cases unobtainable; through the good offices of the Imperial Forestry Bureau, however, several of the more important of these have come to the library almost without a gap.

The library holdings of separate series of bulletins and reports were increased during the year by 57, a remarkable figure even in normal circumstances. Such series emanate from research institutions all over the world, and, as observed in a previous Report, comprise many thousands of items altogether, forming what is in some respects one of the most valuable parts of the library. Moreover, they are sent either in exchange for Institute and Bureau publications or free on request, and do not include non-serial pamphlets, working plans and reprints.

With the decision of the Imperial Forestry Bureau not to continue the arrangement under which Mr. Spoke's services and salary were shared by the two institutions, the whole position was reviewed and the decision reached that Mr. Spokes should be offered a special appointment for a year. During this period he will complete certain items of the work on which he was engaged in connection with the library and the referencing of back literature. An Assistant Librarian, Miss I. S. T. Aspin, has been appointed, the duties of the post including the referencing of current literature and working with Mr. Spokes for the year he remains on the staff; at present she is giving two hours daily to the library and the remainder of her time to the referencing work. In April, Miss M. Browning (Mrs. Lazarus), the bibliographer, resigned on leaving Oxford.

The reclassification of the library contents under the decimal system, hitherto done at odd times when other duties permitted by Mr. P. S. Spokes and Miss Browning, was put entirely into the charge of Mr. Spokes at the close of the year, and a part-time typist was engaged to expedite the work. It is hoped that by the next Report marked progress will have been shown.

Reduction of the risk to the library from enemy action has been considered and the decision reached to transfer some of the more valuable contents, especially runs of early periodicals, to the upper half of the basement, where the danger from flooding is small. This left some very useful space in the overcrowded library shelves, and the opportunity was taken of re-arranging material more conveniently.

Inquiries from outside were dealt with chiefly by the Bureau as is now in practice, but several involving the preparation of lists of literature were partly dealt with by the Librarian.

The Library Committee met three times during the year. Need for these meetings is to some extent reduced by the institution of a weekly report to the Professor personally, in which most points can be settled out of hand.

The Librarian is deeply beholden to three people who gave voluntary help during the year. These are Mr. A. Chalk, Miss Ingram and Mr. H. W. Pierce. Mr. Pierce's total of 280 hours, during which he reorganized the Reports section of the library, incorporating the 108 volumes of Indian Forest Reports kindly presented by the Director of the Royal Botanic Gardens, Kew (to which reference is made elsewhere in this Report), is particularly noteworthy, and the work he accomplished will be of permanent value. His friendly and helpful presence, when he left to take up an appointment, was greatly missed.

Lively gratitude is also due to the makers of gifts to the library, who are: — Dr. Chrystal; Mr. Kissin; Professor Hale Carpenter; Mr. A. K. Gibbon; Mr. A. F. Broun; Major C. P. Ackers; Dr. E. J. H. Corner (Assistant Director of Gardens, Straits Settlements); the Forest Products Research Laboratory; the Macaulay Institute for Soil Research; the Empire Forestry Association; the School of Agriculture, University of Cambridge; the School of Rural Economy, University of Oxford; the Imperial Forestry Bureau; the Smithsonian Institution of Washington; the National Research Council of Canada; the British Museum (Natural History); and the Director of the Royal Botanic Gardens, Kew. The last gift mentioned, of 108 volumes of Indian Forest Reports, many of them of early date and otherwise unprocurable, was of special interest and value. The presentation by Dr. R. N. De, of the final volumes of the

Flora of Assam, should also be acknowledged here, although the books arrived just after the close of the year. Books, etc., were also donated by several members of the staff, including Professor Champion and Dr. Chalk.

FINANCE.

The audited accounts of the Department will be published, after audit, in the *Oxford University Gazette*. The following is a summary of income and expenditure for the year :—

INCOME: Forestry Commission, £3,210; Colonies, £5,014; Dominions, India and others, £400; Fees, £79; other receipts, £54. Total Income, £8,757.

EXPENDITURE: Staff salaries and pension contributions, £6,465; Instructional supplies, £49; Travelling, £225; Administrative and Miscellaneous expenses, £1,094; paid into Capital Account, £50 (payment of instalment on loan). Total Expenditure, £7,883. (Surplus over expenditure, £874.)

H. G. CHAMPION,
Professor of Forestry
(on behalf of the Committee for Forestry).

APPENDIX I

LIST OF STAFF.

I. Staff engaged in Instruction and Research.

Professor H. G. Champion, M.A. (Oxon.), Fellow of St. John's College. Tropical Forestry, Silviculture and Policy.

*L. Chalk, M.A., D.Phil. (Oxon.), University College. Wood Structure and Properties.

*W. R. Day, B.Sc., M.A. (Oxon.), Exeter College. Pathology, Forest Hygiene, Economics and Statistics.

*A. H. Lloyd, M.C., M.A. (Oxon.), Exeer College. Forest Engineering and Utilization. (Absent on military duty from 1st September, 1939.)

A. Foggie, B.Sc. (Edin.). Forest Management and Mensuration.

E. W. Jones, M.A. (Oxon.), Ph.D. (Cantab.), Magdalen College. Silviculture and Ecology.

J. P. M. Brenan, B.A. (Oxon.), New College. Forest Botany.

II. Staff engaged solely in Research for the Forestry Commission.

T. R. Peace, M.A. (Cantab.). Pathology and Mycology. (Absent since October, 1939.)

J. M. B. Brown, B.Sc. (Belfast). Entomology.

R. G. Sanzen-Baker, B.Sc. (Edin.). Forestry Commission Research Officer for England and Wales. Silviculture.

III. Staff of other University Departments assisting in Instructional Work.

R. N. Chrystal, D.Sc. (Edin.), Hon. M.A. (Oxon). Forest Zoology.

A. C. Hoyle, B.Sc., M.A. (Oxon.), Pembroke College. Forest Botany and Ecology.

O. H. Chilton, M.A., M.Sc. (Lond.). Reader in Surveying.

C. G. T. Morison, M.A. (Oxon.), University Reader in Soil Science, Student of Christ Church. Soil Science.

G. R. Clarke, B.Sc., M.A., Demonstrator in Soil Science, School of Rural Economy. Oriel College. Soil Science.

IV. Other Staff.

Secretary-Accountant: Miss L. M. Bishop.
Assistant Secretary: Miss H. M. Edwards.
Librarian: Miss G. Guiney.
Assistant Librarian: Miss I. S. T. Aspin, M.A. (Oxon.).

APPENDIX II

PUBLICATIONS, 1940-41.

By the Staff.

Check-lists of the Forest Trees and Shrubs of the British Empire: No. 5, Tanganyika Territory, Part I. Compiled by F. Bayard Hora, B.A., D.Phil., in collaboration with P. J. Greenway, F.L.S., the Forest Department, Morogoro, and the Tetse Research Department Shinyanga.

* These members of the staff have the status of University Demonstrators, having been reappointed as such with effect from the following dates: Mr. Lloyd, 1.8.39; the remainder, 1.8.41.